

parts, or the substitution of mutually replacing substances, than by any essential and constant characters. If the pyrogenous rocks of every age be restored in imagination to their ancient state of fluidity, and their chemical constitution in this state be calculated from the analysis of their integrant minerals, we shall find a remarkable general analogy running through them, and be able to perceive, in some instances, the reason of those *gradations* in mineral characters, which link into one system a long series of seemingly different rocks.

Mr. De la Beche has given some calculations on this subject, founded on the assumed elementary composition of minerals which are of frequent occurrence in igneous rocks. Some of the analyses adopted by Mr. De la Beche, and the calculations founded on them, are appended, with a few additions of our own.

*Analysis of Minerals in Igneous Products.*

|                  | Silica. | Alumine. | Lime. | Magnesia. | Potash. | Soda. | Oxides of Iron and Manganese. | Fluoric Acid or Boracic acid. | Water. |
|------------------|---------|----------|-------|-----------|---------|-------|-------------------------------|-------------------------------|--------|
| Felspar, common  | 64.0    | 18.9     | 0.8   | -         | 13.7    | -     | 0.7                           | -                             | -      |
| Felspar, albite  | 69.5    | 19.4     | 0.2   | 0.1       | -       | 10.0  | 0.3                           | -                             | -      |
| Mica             | 46.1    | 26.2     | 0.4   | 5.0       | 10.1    | -     | 8.8                           | 1.1                           | 2.0    |
| Hornblende       | 45.7    | 12.2     | 13.8  | 18.8      | -       | -     | 7.5*                          | 6.5                           | -      |
| Augite of Etna † | 52.0    | 3.3      | 13.2  | 10.0      | -       | -     | 16.7                          | -                             | 4.8    |
| Tourmaline       | 36.0    | 35.8     | 0.3   | 4.4       | 0.7     | 2.0   | 15.3                          | 3.5 ‡                         | -      |
| Hypersthene      | 54.2    | 2.3      | 1.5   | 14.0      | -       | -     | 24.5                          | -                             | 1.0    |
| Diallage         | 47.2    | 3.7      | 13.1  | 24.4      | -       | -     | 7.4*                          | -                             | 3.2    |

In this list, the most variable substances are mica, augite, and hornblende; the most uniform is felspar. The variety of composition in mica is extraordinary, as the following comparative table, in which the four

\* Protoxide of iron.  
 ‡ Boracic acid.

† Black augite analysed by Vauquelin.